

IN THE CLAIMS

1 through 33. (Canceled).

34. (Currently Amended) An array of photodiodes extending in two dimensions and comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of a~~corresponding~~ the plurality of substrates;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode;

an electrical interconnection between the plurality of anodes; and

a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

35. (Previously Presented) An array according to claim 34, wherein the plurality of substrates are formed by dividing a single substrate.

36. (Previously Presented) An array according to claim 34, wherein a passivation layer connects the plurality of substrates.

37. (Previously Presented) An array according to claim 34, wherein the plurality of cathodes comprise a plurality of conductive layers formed at the surface of the substrate.

38. (Previously Presented) An array according to claim 37, wherein there is further provided a metal layer on each conductive layer.

39. (Previously Presented) An array according to claim 34, wherein the plurality of anodes comprise a plurality of active regions formed at the first surface.

40. (Previously Presented) An array according to claim 39, wherein there is further provided a metal contact for each active region.

41. (Previously Presented) An array according to claim 34, wherein the electrical interconnection is provided by one of: wire bonding, metal contacts, or a conductive sheet.

42. (Previously Presented) An array according to claim 34, wherein the plurality of substrates is formed on the connector interface.

43. (Previously Presented) An array according to claim 34, wherein the plurality of contacts are connected to the plurality of cathodes by an epoxy.

44. (Currently Amended) An imaging system including an array of photodiodes and a connector interface, the array of photodiodes extending in two dimensions and comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of ~~a corresponding~~ the plurality of substrates;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode; and

an electrical interconnection between the plurality of anodes;

wherein the connector interface is provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

45. (Currently Amended) A computed tomography imaging system including an array of photodiodes and a connector interface, the array of photodiodes extending in two dimensions and comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of ~~a corresponding~~ the plurality of substrates;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode; and

an electrical interconnection between the plurality of anodes;

wherein the connector interface is provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

46. (Currently Amended) A photo-detector array including a plurality of sub-arrays of photo-diodes, each sub-array of photodiodes extending in two dimensions and comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of ~~a corresponding~~ the plurality of substrates;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode;

an electrical interconnection between the plurality of anodes; and

a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes;

wherein the plurality of said sub-arrays of photo-diodes are placed adjacent to each other in a matrix to form the photo-detector array.

47. (Previously Presented) A photo-detector array according to claim 46 wherein the matrix extends in two directions.

48. (Currently Amended) An imaging system comprising:
a radiation detector having a photo detector array including a plurality of sub-arrays of photo-diodes placed adjacent to each other in a matrix to form the photo-detector array;
a radiation source facing the radiation detector; and
means for controlling the radiation detector and the radiation source;
wherein each sub-array of photodiodes extends in two dimensions and ~~includes~~ comprises:
a plurality of substrates;
a corresponding plurality of anodes formed at first surfaces of a ~~corresponding~~ the plurality of substrates;
a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode;
an electrical interconnection between the plurality of anodes; and
a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

49. (Previously Presented) An imaging system according to claim 48, wherein the radiation source is an X-ray tube equipped with a high-voltage generator.

50. (Previously Presented) An imaging system according to claim 48, wherein the radiation detector and the radiation source are radially mounted in a cylindrical scanning structure.

51. (Previously Presented) An imaging system according to claim 48, wherein the means for controlling comprises a computer system.

52. (Currently Amended) A method of forming an array of photodiodes extending in two directions, comprising:
forming a substrate;

forming a plurality of anodes at a first surface of a the substrate;

forming a corresponding plurality of cathodes at a second surface of the substrate, wherein a bulk of the substrate is disposed between the plurality of anodes and the plurality of cathodes;

~~dividing the substrate into a corresponding plurality of substrates; electrically interconnecting the plurality of anodes;~~

providing a connector interface comprising a corresponding plurality of contacts; ~~and~~

electrically connecting the plurality of contacts to the respective cathodes, wherein the plurality of cathodes provide the plurality of output signals of the array; and then:

dividing the substrate into a corresponding plurality of substrates; electrically interconnecting the plurality of anodes.

53. (Previously Presented) A method according to claim 52, wherein the step of forming a plurality of cathodes comprises providing a plurality of conductive layers on the second surfaces of the plurality of substrates.

54. (Previously Presented) A method according to claim 53, wherein the plurality of conductive layers are formed by providing a continuous conductive layer on the second surface of the single substrate, and electrically isolating portions of the continuous layer to form the plurality of conductive layers.

55. (Previously Presented) A method according to claim 54, wherein the portions of the conductive layer are electrically isolated by etching or cutting the continuous conductive layer.

56. (Previously Presented) A method according to claim 55, wherein the step of etching or cutting further etches the substrate.

57. (Previously Presented) A method according to claim 56, wherein the substrate is etched or cut completely.

58. (Previously Presented) A method according to claim 56, wherein a passivation layer on the first surface of the substrate is unaffected by the etch or cut.

59. (Previously Presented) A method according to claim 57 wherein there is thus formed a plurality of isolated substrate portions.

60. (Previously Presented) A method according to claim 55, wherein the etch or cut is patterned such that a contiguous area is etched or cut around each cathode.

61. (Previously Presented) A method according to claim 52, wherein the step of interconnecting the plurality of anodes includes providing between the plurality of anodes one of: wire bonding, a metal interconnect, or a conductive sheet over the first surfaces.

62. (Previously Presented) A method according to claim 52, wherein the connector interface comprises one of: a plurality of pads for connection to the plurality of cathodes, a substrate, or an integrated circuit.

63. (Currently Amended) A method of forming an array of photodiodes extending in two directions, comprising:

forming a plurality of substrates;

forming a corresponding plurality of anodes at first surfaces of a ~~corresponding~~ the plurality of substrates;

forming a corresponding plurality of cathodes at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode;

electrically interconnecting the plurality of anodes;

providing a connector interface comprising a corresponding plurality of contacts; and

electrically connecting the plurality of contacts to the respective cathodes, wherein the plurality of cathodes provide the plurality of output signals of the array.

64. (Previously Presented) A method according to claim 63, wherein the step of interconnecting the plurality of anodes includes providing between the plurality of anodes one of: wire bonding, a metal interconnect, or a conductive sheet over the first surfaces.

65. (Previously Presented) A method according to claim 64, wherein the connector interface comprises one of: a plurality of pads for connection to the plurality of cathodes, a substrate, or an integrated circuit.

66. (Currently Amended) A semiconductor packaging structure comprising an array of photo-diodes and a connector interface, the array of photo-diodes extending in two dimensions and ~~including~~ comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of ~~a corresponding~~ the plurality of substrates;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates, wherein a bulk of each substrate is disposed between a corresponding anode and cathode; and

an electrical interconnection between the plurality of anodes;

wherein the connector interface is provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

67. (Currently Amended) A radiation detector comprising at least one array of photodiodes, at least one of said at least one array of photo-diodes extending in two dimensions and ~~including~~ comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of ~~a~~ the corresponding plurality of substrates;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates,
wherein a bulk of each substrate is disposed between a corresponding anode and cathode;

an electrical interconnection between the plurality of anodes; and

a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.

68. (New) An intermediate photodiode structure comprising:

a plurality of substrates;

a corresponding plurality of anodes formed at first surfaces of the plurality of substrates,
without a layer of optically transparent material over the surface of such;

a corresponding plurality of cathodes formed at second surfaces of the plurality of substrates,
wherein a bulk of each substrate is disposed between a corresponding anode and cathode;

an electrical interconnection between the plurality of anodes; and

a connector interface provided with a corresponding plurality of contacts electrically connected to the respective cathodes for reading output signals provided by the plurality of cathodes.